

REMARKS

By the present Amendment, Applicants propose to amend claim 1 to more appropriately define the invention. This proposed Amendment does not change the scope of the claim and does not raise new issues. Upon entry of the Amendment, claims 1-9 will remain pending.

In the Office Action, the Examiner rejected claims 1-3 and 6 under 35 U.S.C. § 102(e) as anticipated by Kim (U.S. Pat. Pub. No. 2001/0036730); rejected claims 1-6 and 9 under 35 U.S.C. § 103(a) as unpatentable over Kim in view of Cooper et al. (U.S. Patent No. 5,219,793); and rejected claims 7 and 8 under 35 U.S.C. § 103(a) as unpatentable over Kim in view of Chang et al. (U.S. Patent No. 6,159,842) and further in view of Tsai et al. (U.S. Patent No. 6,331,480).

Applicants respectfully traverse these rejections.

In order to properly anticipate Applicants' claimed invention under 35 U.S.C. §102, each and every element of the claim in issue must be found, "either expressly or inherently described, in a single prior art reference." "The identical invention must be shown in as complete detail as is contained in the . . . claim. *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989)." See M.P.E.P. § 2131, 8th ed., 2001.

Regarding the rejection of claims 1-3 and 6 under 35 U.S.C. § 102(e) as anticipated by Kim, Applicants submit that Kim fails to teach each and every elements of these claims.

For example, claim 1 recites, *inter alia*, "(c) etching the interlayer insulting layer by using the bit line patterns and an etching mask defining a straight line shape as a mask,

thereby forming at least one straight line shaped self-aligned contact opening between neighboring bit line patterns; and d) forming spacers on sidewalls of the bit line patterns only exposed through the contact opening.” Kim fails to teach at least these features.

In the Office Action, the Examiner considered Kim’s second oxide layer 106b as corresponding to Applicants’ claimed “interlayer insulating layer,” contact hole 112 as corresponding to Applicants’ claimed “contact opening,” and silicon nitride spacer 113 as corresponding to Applicants’ previously claimed “insulating layers.” Office Action, pages 2-3.

However, Applicants note that Kim only teaches forming a contact hole 112 by “using photoresist pattern layer 110 as an etching mask.” Kim, page 2, paragraph [0020]. Therefore, Kim fails to teach at least “etching the interlayer insulting layer by **using the bit line patterns** and an etching mask defining a straight line shape as a mask, thereby forming at least one straight line shaped self-aligned contact opening between neighboring bit line patterns,” as recited in claim 1 (emphasis added).

Moreover, Kim also fails to teach at least “forming spacers on sidewalls of the bit line patterns only exposed through the contact opening,” as recited in claim 1. As shown in Fig. 2B of Kim, silicon nitride spacer 113 is formed “on the sidewall of contact hole 112,” rather than bit line 107. Kim, page 2, paragraph [0021].

In the section titled “Response to Arguments,” the Examiner argued that “the claim doesn’t teach that the insulating layers is physically in contact with the bit line.” Office Action, page, 8. Applicants disagree. Applicants point out that the word “on” generally indicates a physical contact. Merriam-Webster’s Unabridged Dictionary actually defines the word “on” as being “used as a function word to indicate position

over and in contact with that which supports from beneath.” We attach a copy of this definition for the convenience of the Examiner.

In view of the above, Kim fails to teach each and every element of claim 1. Therefore, claim 1 is allowable over Kim under 35 U.S.C. § 102(e). Claims 2-3 and 6 depend from claim 1 and are also allowable over Kim at least because of their dependency from an allowable base claim.

Applicants further traverse the claim rejections under 35 U.S.C. § 103(a) because the Examiner failed to establish a *prima facie* of obviousness.

To establish a *prima facie* case of obviousness under 35 U.S.C. §103(a), each of three requirements must be met. First, the reference or references, taken alone or combined, must teach or suggest each and every element recited in the claims. Second, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to combine the references in a manner resulting in the claimed invention. Third, a reasonable expectation of success must exist. Moreover, each of the three requirements must "be found in the prior art, and not be based on applicant's disclosure." See M.P.E.P. §2143, 8th ed., February 2003.

Regarding the rejection of claims 1-6 and 9 as unpatentable over Kim in view of Cooper et al., Applicants first submit that, as discussed above, Kim fails to teach or suggest each and every element of claim 1. Particularly, Kim fails to teach or suggest at least “c) etching the interlayer insulting layer by using the bit line patterns and an etching mask defining a straight line shape as a mask, thereby forming at least one

straight line shaped self-aligned contact opening between neighboring bit line patterns; and d) forming spacers on sidewalls of the bit line patterns only exposed through the contact opening,” as recited in claim 1.

Additionally, Cooper does not cure the deficiencies of Kim. Cooper also fails to teach or suggest at least “c) etching the interlayer insulting layer by using the bit line patterns and an etching mask defining a straight line shape as a mask, thereby forming at least one straight line shaped self-aligned contact opening between neighboring bit line patterns; and d) forming spacers on sidewalls of the bit line patterns only exposed through the contact opening,” as recited in claim 1. Cooper merely discloses forming an insulating layer 22 and etching layer 20 using a photoresist mask 24. See Cooper, col. 4, lines 38-67, and Fig. 2. Moreover, there is no suggestion in the references to modify the structures disclosed therein to achieve the claimed combination.

Therefore, Kim and Cooper, taken alone or in reasonable combination, fail to teach or suggest each and every element of claim 1. For at least this reason, claim 1 is allowable over Kim in view of Cooper.

Claims 2-6 and 9, which depend from claim 1, are also allowable over Kim in view Cooper at least because of their dependency from an allowable base claim.

Finally, regarding the rejection of claims 7 and 8 under 35 U.S.C. § 103(a) as unpatentable over Kim in view of Chang et al. and Tsai et al., Applicants submit that these claims are allowable at least because Kim, Chang et al., and Tsai et al. fail to teach or suggest at least each and every element of these claims.

As discussed above, Kim fails to teach or suggest at least “c) etching the interlayer insulting layer by using the bit line patterns and an etching mask defining a

straight line shape as a mask, thereby forming at least one straight line shaped self-aligned contact opening between neighboring bit line patterns; and d) forming spacers on sidewalls of the bit line patterns only exposed through the contact opening," as recited in claim 1.

In addition, Chang et al. discloses a method for fabricating a hybrid low dielectric constant intermetal dielectric layer (Abstract), and Tsai et al. discloses a method for improving the adhesion between an overlying insulator layer and an underlying low K layer (Abstract). Neither Chang et al. nor Tsai et al. cures the deficiencies of Kim with regard to claim 1 of the present invention. Therefore, claim 1 is allowable over Kim, Chang et al., and Tsai et al., at least because of this reason. Claims 7 and 8 are dependent on claim 1 and are also allowable over Kim, Chang et al., and Tsai et al. at least because of their dependency from an allowable base claim.

Applicants submit that, by this Amendment, Applicants are not disclaiming any portion of their invention that might be affected thereby. Applicants expressly reserve their rights to further prosecute their invention in one or more continuation applications.

Applicants respectfully request that this Amendment after Final be entered by the Examiner, placing the application, *prima facie*, in condition for allowance. This Amendment after Final should allow for immediate and favorable action by the Examiner. Also, Applicants submit that the entry of this Amendment would place the application in better form for appeal, should the Examiner continue to dispute the patentability of the pending claims. Applicants, therefore, request the entry of this Amendment, the Examiner's reconsideration of the application, and the timely allowance of the pending claims.


Should the Examiner continue to dispute the patentability of the claims after consideration of this Amendment, Applicants invite the Examiner to contact Applicants' representatives by telephone to discuss any remaining issues.

Please grant any extensions of time required to enter this response and charge any additional required fees to our deposit account 06-0916.

Respectfully submitted,

FINNEGAN, HENDERSON, FARABOW,
GARRETT & DUNNER, L.L.P.

Dated: July 23, 2004

By: 
Qingyu Yin*

*With limited recognition under 37 C.F.R. § 10.9(b)

Main Entry: *on*
 Pronunciation: (l)òn, (l)än, *in the southeastern US sometimes* (l)õn
 Function: *preposition*
 Etymology: Middle English, preposition & adverb, fr Old English *an, on*, preposition & adverb; akin to Old High German *ana*, preposition & adverb, on, at, Old Norse *ā*, preposition & adverb, Gothic *ana*, preposition & adverb, on, at, Latin *an-* (in *anhelare* to pant) Greek *ana*, prep & adverb, up, on, Sanskrit *ann*, preposition & adverb, after

1 a — used as a function word to indicate position over and in contact with that which supports from beneath <the book is *on* the table> <was built *on* an island> <kept his hands *on* the desk> b — used as a function word to indicate presence within <rode there *on* a train> <booked passage *on* an ocean liner> c — used as a function word to indicate situation along a whole surface <a streak *on* the wall running from top to bottom> or at any particular point on a surface <there wasn't a mark *on* it> or to indicate situation at the projecting usually supporting edge or point or end of something <their clothes hung *on* a couple of nails in the wall> or situation inside of something (as clothing) worn by or covering the principal object of attention <found a knife *on* him>

2 — used as a function word to indicate contiguity or dependence; especially (1) contact and support from elsewhere than beneath <a fly *on* the ceiling> <hanging *on* the wall>; (2) location closely adjoining something <a town situated *on* the river> or location very near some point of a narrowly extended area (as a street) <lives *on* the principal street of the town>; (3) imminence or beginning (as of some action or activity) <the storm is *on* us>; (4) connection or employment or activity with or in or with regard to something <works *on* the committee> <is now *on* the third problem> <will be *on* duty> <has long been successful *on* the stage>; (5) engagement in doing something <are now *on* a tour around the country>; (6) source or support or basis on which something (as an action, opinion) turns or rests <learned it *on* good authority> <his reliance *on* her> <will do it *on* one condition>

3 a — used as a function word to indicate position with regard to place, direction, or time; especially (1) position with regard to a point of the compass <*on* the west are rolling plains>; (2) position near a specified part of something <*on* the side of the house is a garden>; (3) occurrence during the course of a specified day <will see them *on* Monday> or of some other divisions of time <said she would write *on* the morrow> or at a set time <trains leave here every hour *on* the hour>; (4) occurrence at the same time as or following or as a result of something <will send a check *on* receipt of the book> <will do it *on* your arrival> <was uneasy *on* arriving home and finding no one there> b — used as a function word to indicate location in or progress along something taken as a standard <is *on* the right road> <a boat keeping *on* course>

4 a — used as a function word to indicate involvement in a specified condition <the house is *on* fire> <beer *on* tap> <merchandise *on* sale> or process <business is *on* an upturn> b — used as a function word to indicate participation in a condition of privilege <has been *on* sick leave> or subjection to a condition of restriction <is *on* probation>

5 — used as a function word to indicate manner <did it *on* the sly> <cut it *on* the bias>

6 — used as a function word to indicate the object of action or motion; especially (1) the object of action or motion coming especially down from above so as to touch or strike the surface or cover the upper part <watched the rain fall *on* the earth> <put a lid *on* the jar>; (2) the object of action or motion directed up to or against the object <crept up *on* him> <marched *on* the ancient fortress>; (3) the object of action or motion directed toward the object without actual physical contact <smiled *on* her> <blamed it *on* them> <was always bent *on* fighting>; (4) the object of some emotion <had pity *on* them> or formality <served an injunction *on* him> or obligation <a charge *on* an overdue book>; (5) the object in

connection with which payment, computation of interest, reduction, or similar settlement is made <paid off a substantial sum *on* the mortgage> <creditors received about 75 cents *on* the dollar> <a rebate of 15 cents *on* a ton> <an inroad *on* supplies>

7 a : with regard to : with reference or relation to : ABOUT <agreed *on* a price> <a monopoly *on* wheat> <a satire *on* society> <at variance *on* what to do> b *chiefly dialect* : OF <be not jealous *on* me— Shakespeare>

8 — used as a function word to indicate means or agency <cut her finger *on* a knife> <playing the latest hits *on* the piano> <heard it *on* the radio>

9 — used as a function word to indicate reduplication or succession in a series <trouble *on* trouble followed his involvement with her> <loss *on* loss>

10 — used as a function word to indicate an object of reference; especially (1) an object having some advantage or disadvantage <is very talented but has nothing *on* her brother who is a real genius> <his brother has two inches *on* him in reach>; (2) an object subjected to expense or cost <drinks are *on* the house> <the joke was *on* me>; (3) an object that bears some stress or strain <long hours began to tell *on* him>; (4) an object subjected to indicated annoyance <the fire went out *on* him> <don't try to pull that *on* me> or discomfiture or some other unwanted or detrimental thing